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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,569	08/07/2001	Saburo Sugawara	1232-4750	6995

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EXAMINER

CRUZ, MAGDA

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,569

Applicant(s)

SUGAWARA ET AL.

Examiner

Magda Cruz

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2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-16, 18, 19, 21 and 23-27 is/are rejected.
- 7) ☒ Claim(s) 5-8, 17, 20 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. On the communication filed on 02/25/2003 the applicant acknowledge the submission of a proposed drawing for Figure 25. However, said communication does not have a proposed drawing correction. The drawing informalities noted in Paper No. 7, mailed on 10/2/2002, must now be corrected.
2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Claim Objections

3. Claim 5 is objected to because of the following informalities: there is a spelling error on line 3 of said claim, "prims" instead of - - prisms - - . Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 5, 9-16, 18-19, 21, 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Okuyama.

Sato (US Patent Number 6,456,447 B1) discloses a color combining optical system (Figure 7) for combining a color light (R, G, B) reflected by a dichroic film (3b) and a color light transmitted through the dichroic film (3b), comprising a plurality of prisms (2A, 2B, 3, 4, 5) having optically smooth surfaces cemented to one another (7), wherein said dichroic film (3b) is formed on an interface between two of the plurality of prisms (column 13, lines 1-14). The color combining prism incorporates two dichroic films (3a, 3b) for reflecting different color light beams (column 14, lines 30-32) and arranged between said prisms so as not to cross each other. A prism (4), of the plurality of prism, has at least three optically flat surfaces (4a, 4b, 4c), and an exit surface also serving as a totally reflecting surface (column 13, lines 37-45). The angle θ_1 is defined by a surface of the color combining prism (3) which is located on an exit side (surface 3b) and on which a dichroic film is formed and an exit surface (surface 3a) of said color combining prism satisfies $20^\circ < \theta_1 < 35^\circ$. The angle θ_2 is defined by an exit surface of said color combining prism (3) and a surface of said color combining prism which is located on an incident side (surface 3c) and on which a dichroic film (surface 3b) is formed satisfies $40^\circ < \theta_2 < 50^\circ$.

Sato teaches the salient features of the present invention, except a dichroic film wherein the optical thickness increases and decreases from one end side to the other end side in a direction of the dichroic film with respect to an incident optical axis of the color light reflected by the dichroic film. However, Sato discloses a dichroic film (3b).

Okuyama (US Patent Number 6,273,568 B1) discloses a dichroic film wherein the optical thickness increases or decreases from one end side to the other end side (Figure 24) in an inclining direction of the dichroic film with respect to an incident optical axis of the color light reflected by the dichroic film (column 13, lines 12-14). The color combining optical system (Figure 1) wherein color-synthesizes a plurality of light beams from a plurality of image modulation means (column 5, lines 42-51), enlarging/projecting combined image light from said color combining optical system (column 6, lines 26-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the dichroic film disclosed by Okuyama in substitution of the dichroic film from Sato's invention, for the purpose of having a color combining system that project the image information onto a predetermined surface (a screen surface) without any color irregularity while having high optical performance (column 3, lines 51-54).

6. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Okuyama as applied to claims 1-2, 5, 9-16, 18-19, 21, 23-27 above, and further in view of Peng.

Sato (US Patent Number 6,456,447 B1) in combination with Okuyama (US Patent Number 6,273,568 B1) teaches the salient features of the present invention, except a dichroic film wherein the refractive index increases or decreases from one end side to the other end side in the inclining direction and wherein the optical thickness increases as an incident angle of the reflected chromatic light increases. However, Okuyama discloses a dichroic film (3b).

Peng (US Patent Number 6,235,435 B1) discloses a dichroic film (24) wherein the refractive index increases or decreases from one end side to the other end side in the inclining direction (column 3, line 66 through column 4, line 1) and wherein the optical thickness increases as an incident angle of the reflected chromatic light increases (column 4, lines 1-12).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the dichroic film disclosed by Peng, in substitution of the dichroic film from Okuyama's invention, for the purpose of increasing the image resolution (column 6, lines 13-17).

Allowable Subject Matter

7. Claims 6-8, 17, 20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not teach a color combining optical system, comprising in combination with the additionally recited elements, a positive refracting optical element which has a positive refractive power and causes the reflected color light to be incident on the color combining prism, wherein said color combining prism and said positive refractive optical element are integrally formed; wherein $|L_{in}/L| > 4$ is satisfied, where L_{in} is a distance from an incident pupil of said entire overall image projection optical

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system including said projection optical system, said color combining prism, and said positive refracting optical element to a display portion of said image modulation means, and L is a diagonal length of the image display portion of said image modulation means; wherein $0.07 < L/f < 0.35$ is satisfied, where f is a focal length of said positive refracting optical element.

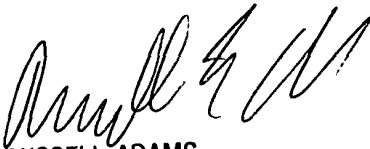
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Magda Cruz whose telephone number is (703)308-6367. The examiner can normally be reached on Monday through Thursday 8:00-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on (703)308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1782.

Magda Cruz
Patent Examiner
July 2, 2003



RUSSELL ADAMS
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